



*Better Buildings Residential Network  
Peer Exchange Calls*

***EMERGENCY Replacements – the Biggest Real  
World Obstacle to Efficiency?***

*September 23, 2021*

# Agenda and Ground Rules

- Agenda Review and Ground Rules
- Opening Poll
- Residential Network Overview and Upcoming Call Schedule
- Featured Speakers
  - **Charley Cormany, Efficiency First**
  - **Jesus Pernia, Eversource Energy**
  - **Geoff Wickes, Northwest Energy Efficiency Alliance (NEEA)**
- Open Discussion
- Closing Poll and Announcements

## Ground Rules:

1. **Sales of services and commercial messages are not appropriate** during Peer Exchange Calls.
2. Calls are a safe place for discussion; **please do not attribute information to individuals** on the call.

*The views expressed by speakers are their own, and do not reflect those of the Dept. of Energy.*

# Better Buildings Residential Network

## Join the Network

### Member Benefits:

- Recognition in media and publications
- Speaking opportunities
- Updates on latest trends
- Voluntary member initiatives
- One-on-One brainstorming conversations

### Commitment:

- Members only need to provide *one number*: their organization's number of residential energy upgrades per year, or equivalent.

### Upcoming Calls (2<sup>nd</sup> & 4<sup>th</sup> Thursdays):

- 10/14: *The Future of Investments in Residential Energy Efficiency and What it Means Now*
- 10/28: *Remodeling – The Biggest Untapped Efficiency Opportunity?*

Peer Exchange Call summaries are posted on the Better Buildings [website](#) a few weeks after the call

For more information or to join, for no cost, email [bbresidentialnetwork@ee.doe.gov](mailto:bbresidentialnetwork@ee.doe.gov), or go to [energy.gov/eere/bbrn](http://energy.gov/eere/bbrn) & click Join

# Call Attendee Locations



# Opening Poll

- What is your organization's experience or familiarity with emergency replacements?
  - Very experienced/familiar
  - Some experience/familiarity
  - Limited experience/familiarity
  - No experience/familiarity
  - Not applicable



**Charley Cormany**  
**Efficiency First**



# Emergency Replacements – The Biggest Real World Obstacle to Efficiency?

**Presented by: Charley Cormany**

Executive Director – EFCA

Sept. 23, 2021



## Introduction – Who we are

- Charley Cormany – Efficiency First California’s Executive Director.
- He is a former Home Performance Contractor with over fifteen years in the industry.
- Efficiency First California (EFCA) is a non-profit trade organization that represents Energy Efficiency and Clean Energy contractors in California.
- EFCA is also Program Administrator for Sacramento’s Municipal Utility District (SMUD). We manage their residential rebate programs.



## A unique perspective

EFCA was created by Home Performance contractors. Our staff have contracting backgrounds.

Our goal is supporting contractors and promoting clean energy.

We fund the organization by providing support services to utilities. One of our clients is Sacramento's Municipal Utility District or SMUD.

SMUD is an all-electric, not-for-profit, municipal utility.



## A unique perspective

We manage all of SMUD's residential rebate programs. We also manage and support their Trade Ally Network.

SMUD is an all-electric utility that transitioned to measuring Greenhouse Gas reductions over GWh of savings (1<sup>st</sup> in the nation?)

Energy Efficiency measures change when GHG savings are the goal

We are experienced Contractor's that support and design rebate programs. We think this is a significant advantage for SMUD, and us.



## We support electrification

SMUD has structured its incentive programs to support electrification and all-electric buildings.

The program rewards contractors for “conversions” - Converting from natural gas to electric.

Heat pump space heating and heat pump water heaters are the primary focus, along with some core EE measures.

Efficiency First is determined to keep some EE measures as part of the electrification effort. We believe building envelope improvements go hand-in-hand with electrification.



## Change is hard for most people

Contractors don't like change. The easiest, and likely most profitable solution is changing "like for like."

The reality is most furnaces and water heaters are replaced upon failure.

Heat pump space heating and heat pump water heaters are not always easy to convert. Often times they require additional work, such as electrical upgrades. Which adds complexity, and time, to projects.

Even with our dedicated contractor base, we hear from customers that contractors are talking them out of heat pumps and selling gas appliances instead.



# Factors impeding doing “the right thing”



## 1. Education

- Consumers are not aware of their choices and seldom think beyond restoring service as soon as possible.
- Contractors fail to embrace new technologies as they add complexity and can reduce profits. We need to teach them how they can make more money.
- Include installers. Provide language options.
- Educate building officials and policymakers.

Fact - Outreach to the general population is expensive and requires collaboration.

## “The Switch Is On” – Messaging samples

The Building Decarbonization Coalition is running a “consumer awareness campaign” in California called – The Switch Is On which promotes all-electric homes.



\*For reference only – these are not final versions

# Factors impeding doing “the right thing”

## 1. Time

- Consumers want their restored as soon as possible.
- The fastest solution is to replace the appliance with the exact same thing. This is fastest and easiest solution for contractors.
- The trouble is that means 15+ years of GHG emissions. We can't afford to keep doing this.
- Gas appliance may not be an option going forward but what can we do today?



## Buying time by using temporary solutions

**Many customers will support converting to clean, electric options if:**

1. It does not impact their service – space heating, hot water, etc. Most people don't mind taking more time if they have basic service.
2. The solution is close to the same cost or slightly higher. In my opinion this is where incentives play a significant role

The question is “How do we do this?”



## Buying time by using temporary solutions

Honestly, it's not that hard and some contractors have figured it out.

Restore service with:

- Temporary heating and cooling solutions
- Temporary water heating solutions

Here are a couple of examples:

1. **Heating and Cooling.** Use “local comfort” to buy time.



Portable air conditioning units.



Oil filled radiators

# Buying time by using temporary solutions

## Buying time to do more complete projects

### 2. Water heating - Temporary water heating solutions

Here are some ideas:

- Install a traditional gas unit to restore service



We have a contractor in the SMUD program who is having success with this approach. They return later replace it with a Heat Pump Water Heater.

# Buying time by using temporary solutions

## Buying time to do more complete projects

- Install a self-contained gas unit to restore service?
- You can convert a gas water heater and run it off propane. The entire unit would be self contained and simply hook up to existing plumbing.
- This could be a viable option as a short term solution.



Self-contained propane water heater. This one is set up for warm showers while camping. You could use the same approach with a tank style water heater.

## We can address this issue

### Conclusion –

- **Education** and **Time** are the two big factors.
- Emergency replacements are the norm.
- Experience tells me. Customers will embrace a more complete approach, *if their immediate needs are met.*
- It might take some out-of-the-box thinking
- We should explore using temporary solutions to “buy time”
- **There is hope. I am convinced we can figure it out.**

Need more information or have a comment?

[www.energycfirstca.org](http://www.energycfirstca.org)

**Charley Cormany** - Executive Director (EFCA)

[ccormany@energycfirstca.org](mailto:ccormany@energycfirstca.org)

Phone: (916) 384-0324

Check out our new clean energy Contractor Directory

**The Clean Energy Connection**

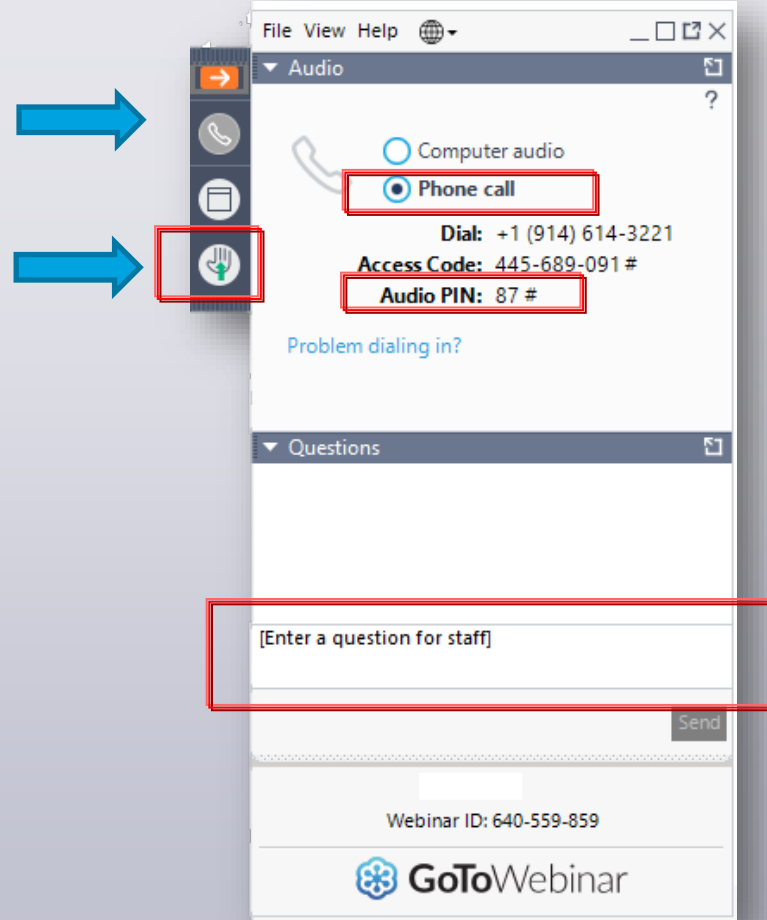
[www.cleanenergyconnection.org](http://www.cleanenergyconnection.org)



# Discussion: Share Your Questions

Open and close  
your **control  
panel**

**Raise your  
hand** to enter  
the discussion



Please use the  
**questions box** to  
submit questions,  
comments, or  
alert us of  
technical  
difficulties

If you have called in on a phone today, double check that you've selected telephone as your audio option.



Jesus Pernia  
*Eversource Energy*

U.S. DOE Better Buildings  
Residential Network



# Emergency Replacements

How to keep energy efficiency top of mind

# Eversource at a Glance

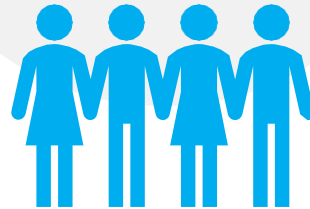


3 STATES

Largest energy  
company in  
New England

Servicing electric,  
natural gas, &  
water

4M CUSTOMERS



8,300  
EMPLOYEES

Across all three  
states

\$700m+ annual  
energy efficiency  
investment

#1 ENERGY  
EFFICIENCY  
PROVIDER IN THE  
NATION





# Empowering Connecticut to Make Smart Energy Choices



Eversource, CNG, SCG and UI, the Energy Efficiency Board, Connecticut Green Bank, and the State have united on a shared mission - to provide Connecticut residents and businesses the resources they need to **save money and use clean energy**.

The Energize Connecticut initiative empowers our communities to make smart energy choices, now and in the future.



# CT Residential Energy Efficiency Programs

RESIDENTIAL NEW CONSTRUCTION

MULTIFAMILY INITIATIVE

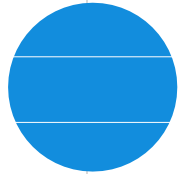
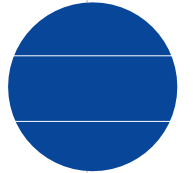
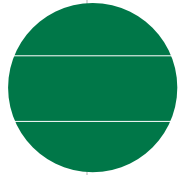
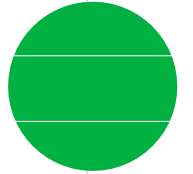
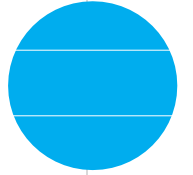
HOME ENERGY SOLUTIONS / HOME ENERGY SOLUTIONS

Income eligible

RETAIL PRODUCTS

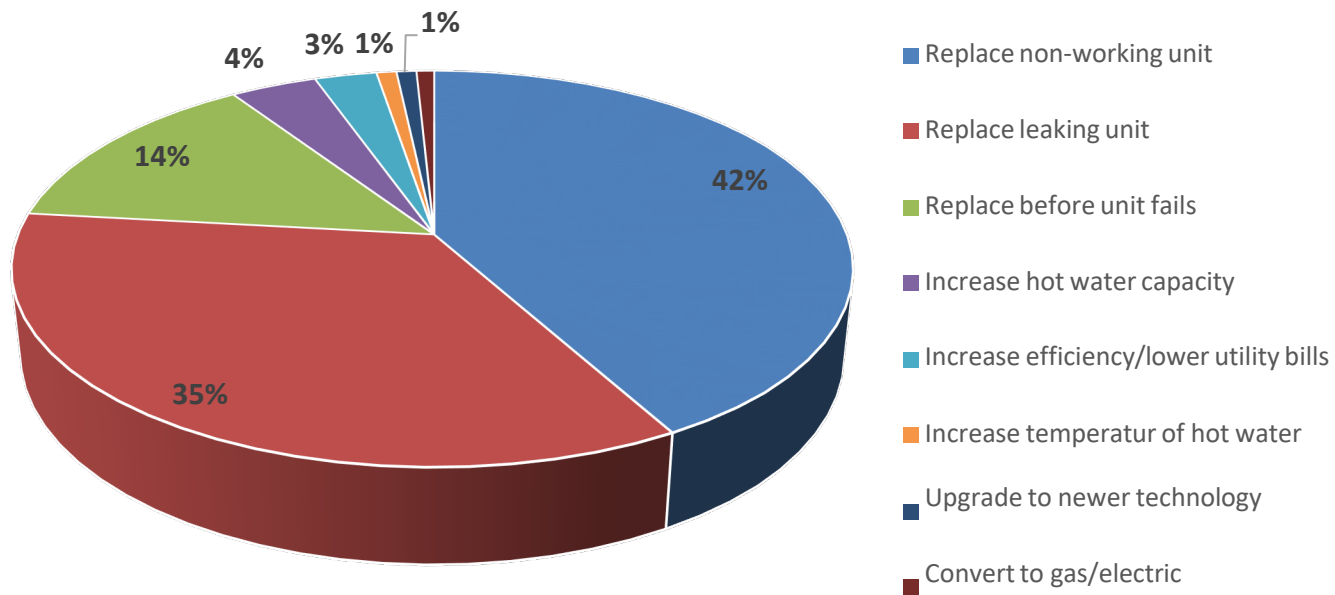
Lighting and appliances

RESIDENTIAL HVAC AND WATER HEATING PROGRAM



# Emergency Replacement

## Top Reason For Water Heating Replacement Survey



Source: KeyStat Marketing YE4Q18





Greater up-front  
cost to purchasing  
the efficient option



Lack of awareness  
of the energy  
efficient option



Limited stocking of  
efficient equipment



Emergency  
Replacements

# Instant Discount Midstream Rebates

- HVAC and Plumbing Distributors can enroll by signing a Memorandum of Understanding (MOU)
  - Provide the full incentive on eligible equipment to customers
  - Collect and report customer and contractor information
- Retailer stores selling heat pump water heaters can offer instant discount bar codes

Stakeholder	Benefits
Manufacturer	<ul style="list-style-type: none"><li>• Push latest technology to market</li><li>• Increased profits and market share</li></ul>
Distributor	<ul style="list-style-type: none"><li>• Increase stocking of high efficiency equipment</li></ul>
Contractor	<ul style="list-style-type: none"><li>• Lower first cost and equipment upsell</li></ul>
End-users	<ul style="list-style-type: none"><li>• Lower first cost</li><li>• No rebate processing (time and money)</li><li>• Energy and lifetime cost savings</li></ul>

# Instant Discount Eligible Equipment



UP TO \$500/TON REBATE FOR MINI-SPLIT DUCTLESS HEAT PUMP



UP TO \$750 REBATE FOR HEAT PUMP WATER HEATERS



\$100 REBATE FOR THERMOSTATS



\$750 REBATE FOR NATURAL GAS BOILERS



\$650 REBATE FOR NATURAL GAS FURNACES



\$300 REBATE FOR NATURAL GAS WATER HEATERS



\$35 REBATE FOR ELECTRONIC COMMUTATED MOTOR (ECM) CIRCULATOR PUMPS

# Instant Discount Promotion

**SPECIAL PRICING**  
on select ENERGY STAR®  
Heat Pump Water Heaters here!

**INSTANT DISCOUNT  
\$750**

**STEP 1**  
Take one of these three actions to get started:  
a. Scan this QR code  
b. Text "APPD" to 860-406-5551  
c. Visit [e-rebates.org/EnergizeCT\\_HPWH](http://e-rebates.org/EnergizeCT_HPWH)

**STEP 2**  
Enter information to check your eligibility.

**STEP 3**  
Receive a text message with the link to access your instant rebate code and redeem at checkout.

Qualified product must have a 5.0 Uniform Energy Factor or higher and a storage capacity of 55 gallons or less.

SPECIAL PRICING BROUGHT TO YOU BY

**energize CT** **EVERSOURCE** **UI**

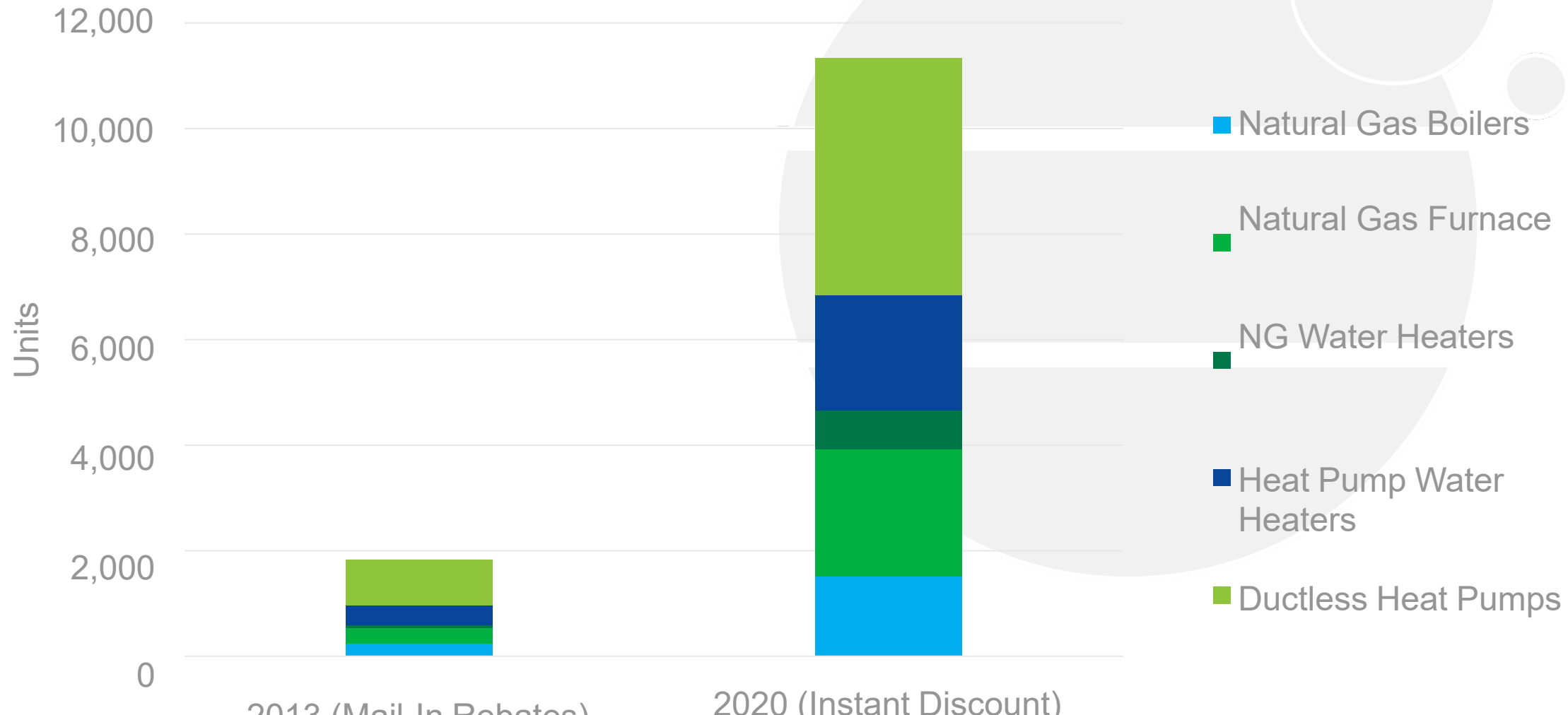
Energize Connecticut – programs funded by a charge on customer energy bills.

Instant Discount  
Redeem  
Instructions

$\$1,199 \text{ HPWH Price}$   
 $- \$750 \text{ Instant Discount}$   
 $\underline{\hspace{1cm}}$   
 $\$449 \text{ Final Price}$



# Eversource CT HVAC/Water Heating Rebate Activity



# Marketing & Educational Efforts

PROGRAMS WEBSITE

POINT OF PURCHASE (POP)

DIGITAL MEDIA

DIRECT MAIL & BILL INSERTS

CUSTOMER POSTCARD

EDUCATIONAL BROCHURES

CONTRACTOR TRAINING PORTAL

**\$750 INSTANT DISCOUNT**  
on select ENERGY STAR® Heat Pump Water Heaters here!

**STEP 1**  
Take one of these three actions to get started:  
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b. Text "APPLY" to 860-406-5551  
c. Visit [e-rebates.org/EnergizeCT\\_HPWH](http://e-rebates.org/EnergizeCT_HPWH)

**STEP 2**  
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**STEP 3**  
Receive a text message with the link to access your instant rebate code and redeem at checkout.

Qualified product must have a 3.0 Uniform Energy Factor or higher and a storage capacity of 55 gallons or less.  
SPECIAL PRICING BROUGHT TO YOU BY  
**energize CONNECTICUT**  
**EVERSOURCE**   
Energize Connecticut – programs funded by a charge on customer energy bills.

**Get your instant savings today**  
Visit your local Lowe's or Home Depot and look for the Energize CT logo or speak to your plumber. Right now a qualifying 50-gallon heat pump water heater is as little as \$614 after the instant discount and manufacturer discounts.\*\* Plus, you may receive a \$300 Federal Tax Credit.  
If you need help installing your new heat pump water heater, please consult a plumber. This offer is good until December 31, 2021.

**STEP 1**  
Take one of these three actions to get started:  
a. Scan this QR code  
b. Text "APPLY" to 860-406-5551  
c. Visit [e-rebates.org/EnergizeCT\\_HPWH](http://e-rebates.org/EnergizeCT_HPWH)

**STEP 2**  
Enter information to check your eligibility.

**STEP 3**  
Receive a text message with the link to access your instant rebate code and redeem at checkout.

Save even more with Home Energy Solutions™ | 877-WISE-USE or [eversource-hes.com/heswh](http://eversource-hes.com/heswh)

**EVERSOURCE**  
107 Selden Street  
Berlin, CT 06037

**Hot Savings on Hot Water**  
\$750 Instant Discount on Heat Pump Water Heaters

**EVERSOURCE**  
For a reliable, efficient stream of hot water, consider a heat pump water heater.  
They use half the energy of standard electric water heaters saving you up to \$530 each year on energy.\*

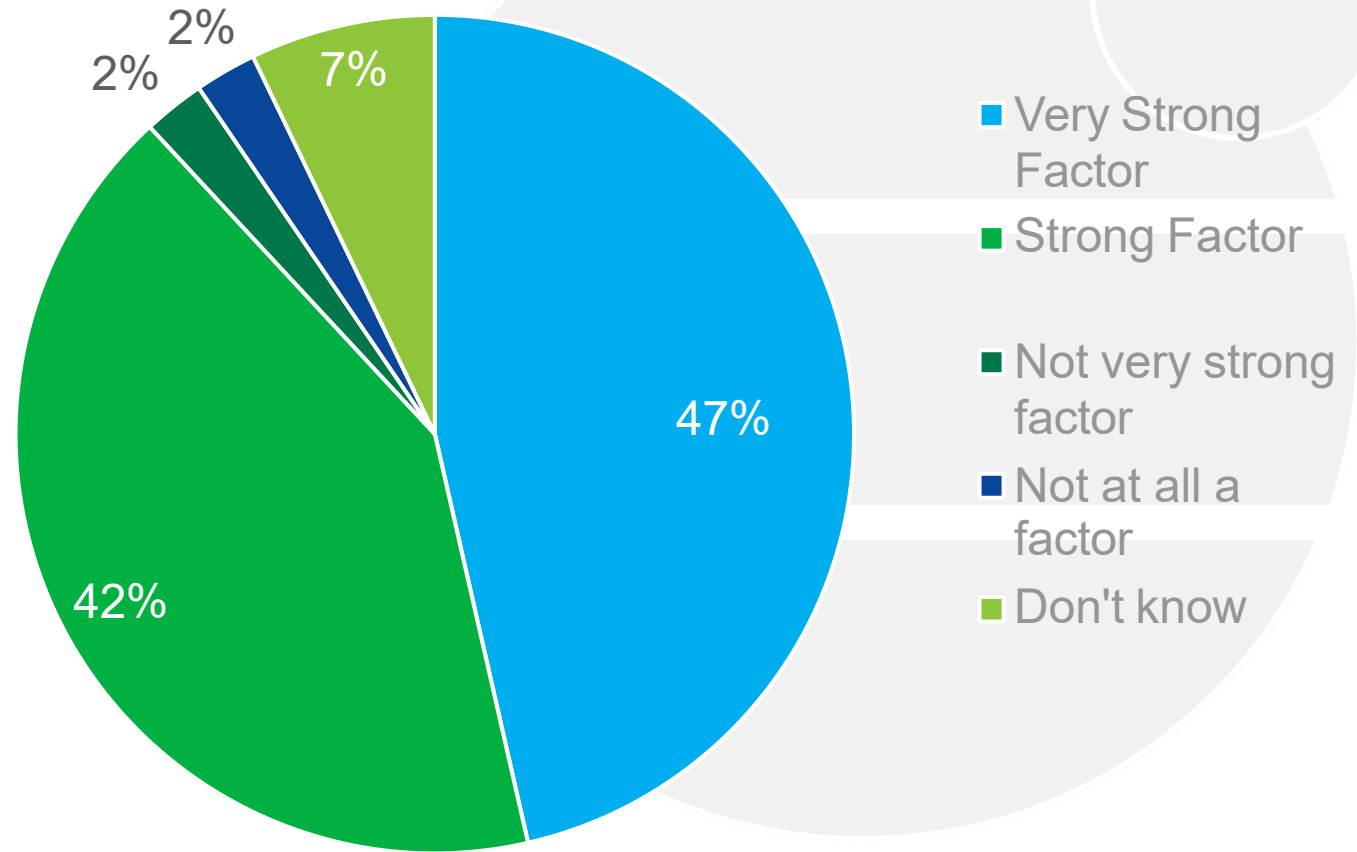
**UPGRADE NOW AND WARM UP IN SAVINGS**  
\*Based on energy savings information for heat pump water heaters located on the ENERGY STAR website and the residential electric cost of 20 cents/kWh in Connecticut. Refer to [eversource-hes.com/heswh](http://eversource-hes.com/heswh) for product details, water heaters, high efficiency, energy, costs, gas, water, heating, benefits, savings.

**Congratulations on your high efficiency equipment purchase!**  
You are saving by making smart energy choices.

**EVERSOURCE**   
Part of the AVANGRID Family

# CT Contractor Survey

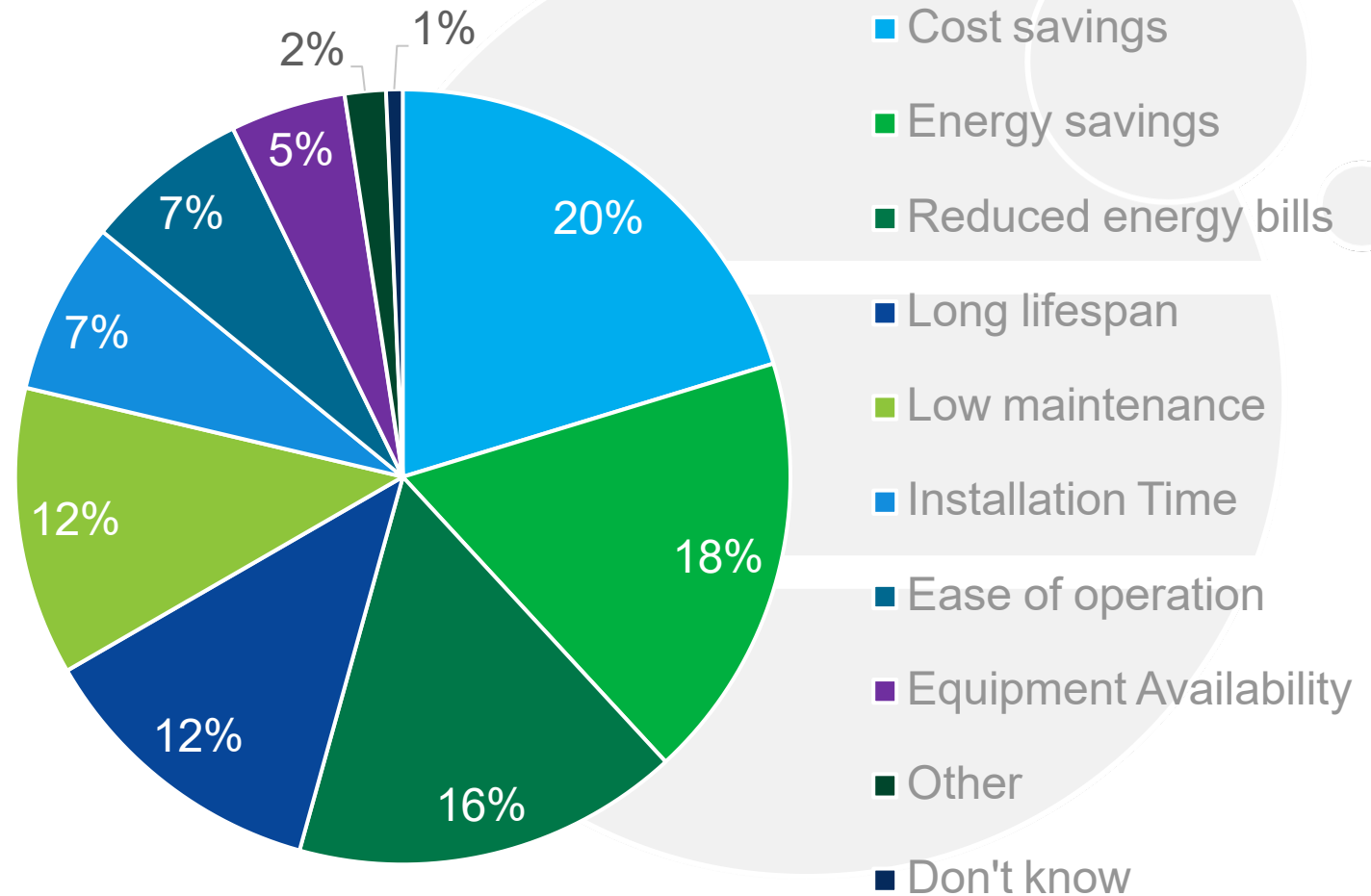
How strong of a factor is the instant discount in a customer decision to proceed with HVAC equipment upgrades?



Source: 2017 HVAC Contractors + Distributor Market Assessment conducted by greatblue

# CT Contractor Survey

What are the most important factors your customers consider when looking to upgrade their heating system?



Source: 2017 HVAC Contractors + Distributor Market Assessment conducted by greatblue



**EVERSOURCE**

**Thanks**  
**for listening.**



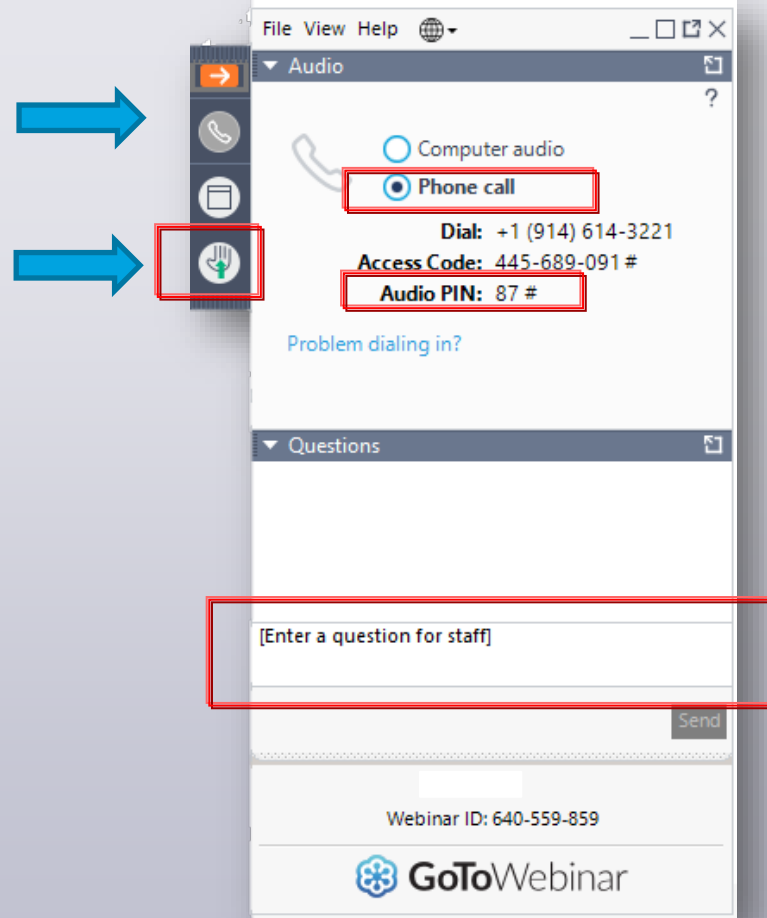


Questions

# Discussion: Share Your Questions

Open and close  
your **control  
panel**

**Raise your  
hand** to enter  
the discussion



Please use the  
**questions box** to  
submit questions,  
comments, or  
alert us of  
technical  
difficulties

If you have called in on a phone today, double check that you've selected telephone as your audio option.



**Jesus Pernia**

[jesus.pernia@eversource.com](mailto:jesus.pernia@eversource.com)

Phone: 860-665-5331





**Geoff Wickes**  
*Northwest Energy Efficiency Alliance*  
*(NEEA)*

September 23<sup>rd</sup>, 2021



# Heat Pump Water Heaters Emergency Replacements Challenges and Solutions

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Helping Customers Make the Best Water Heating Decisions

Geoff Wickes, Senior Product Manager, Emerging Technology NEEA

**HOT**  
**WATER**  
**SOLUTIONS**

# Who is NEEA ?



HOT  
WATER  
SOLUTIONS



# What Drives Emergency Replacements?

- People don't think about their water heaters.
- Electric Resistance Water Heaters are the ideal appliance until they aren't.
- Homeowners don't save for a water heater replacement.
- Most water heaters last 12-14 years.
- Plumbers like to replace "like for like".
- Hybrid Water Heaters have a higher first cost.



# What are the key challenges to overcome?

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Challenges with small spaces – Best locations.



How do you manage condensate?



What size does the customer need?

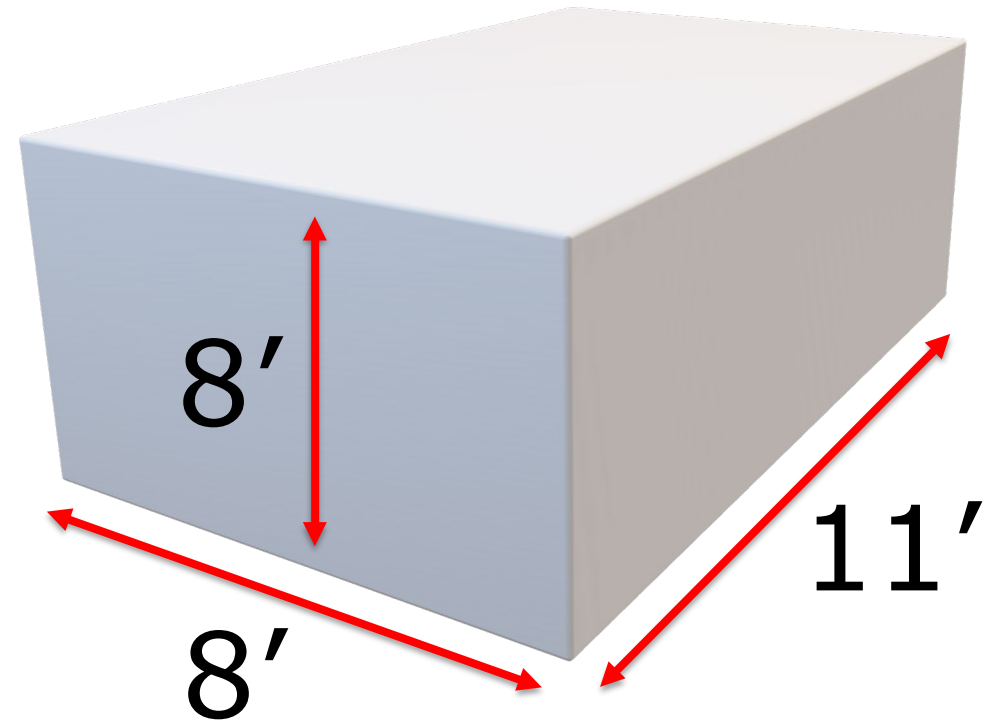


How do you sell value not first cost?

# Best locations for Heat Pump Water Heaters

- Garages and open basements are ideal.
- ~700 cubic feet of space (roughly an 8x8x11 room).
- Compensate by adding louvered doors, venting or ducting.
- Ducting is usually not needed. If it is, you must follow ducting recommendations.

**Example 8 x 8 x 11 = 704 cubic feet**



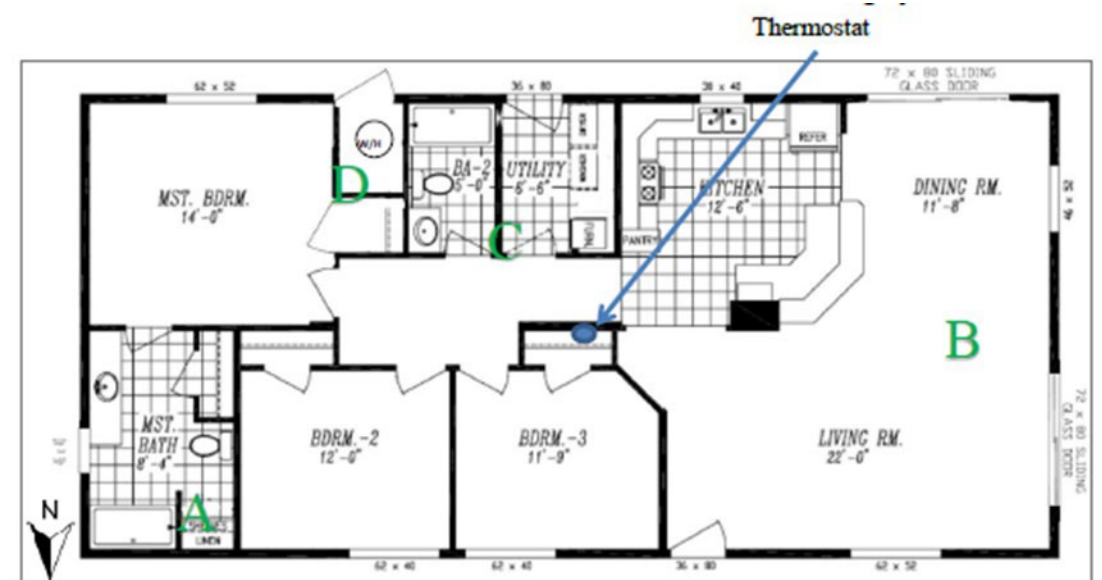
# Locations to avoid and solutions

## Challenges:

- Confined spaces.
- Proximity to thermostats.
- In or near sleeping spaces.
- Where cooler dry air would be a negative experience.
- Location where noise might be noticeable.
- Locations where servicing filter might be a challenge.

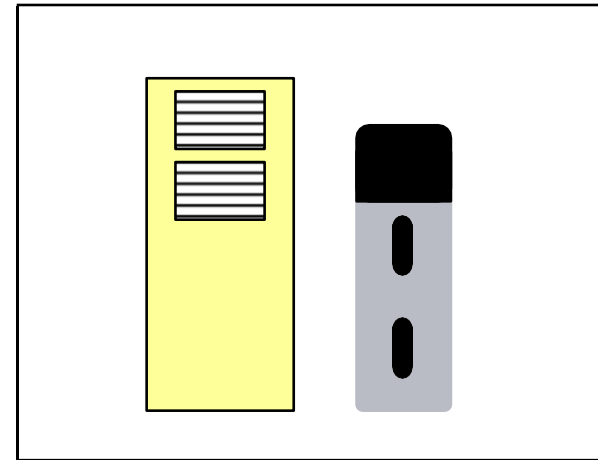
## Solutions:

- Move the water heater to a different location.
- Ducting
- Sound and cooling dampening.
- Locate where cooling would be a benefit.

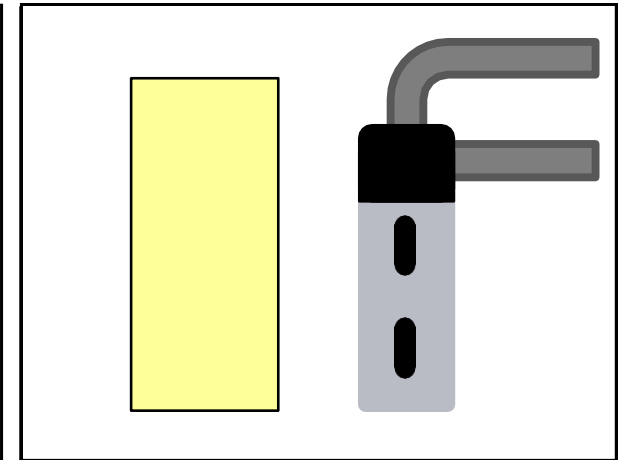


## Finding air elsewhere

- Louvered doors or other forms of venting.
- Outside to outside ducting.
- Inside to outside ducting (may cause negative pressure in tight homes and increase heat loss).
- Inside to inside ducting (usually the best solution).
- Move the heater to a different location.



Louvered Door



Ducting Kit

# HPWHs and Space Heat Interaction PNNL Study

**1-2 degrees** temperature impact during heating months.

Effects are felt **only when the unit is running**, 3-5 hours/day.

Only impacts installs in conditioned space; **not garages or basements.**

Study: <https://nea.org/resources/interaction-between-heat-pump-water-heaters-or-other-internal-point-source-loads-and-a-central-heating-system>



# Case Study: Victor, MT Electric Hybrid Water Heater Install

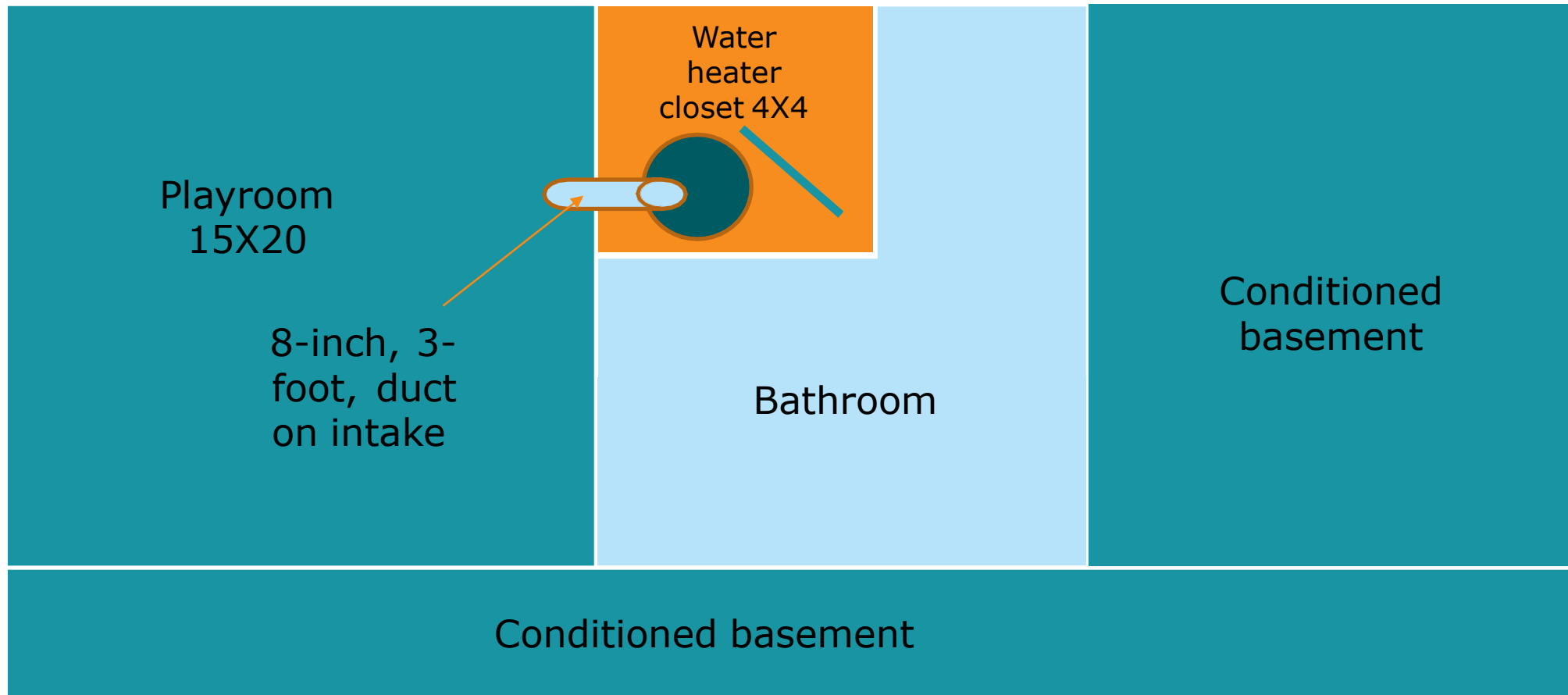
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# Case Study: Overall view of an Installed Hybrid heater



# Case Study: General Basement Layout



# Case Study: Technical View

3 feet of flex, one 90° bend, one 8 to 6 reducer, and a 6-inch intake grille within duct limits



# Case Study: Technical View

6-inch hole for intake duct from playroom.



Intake grille in playroom.

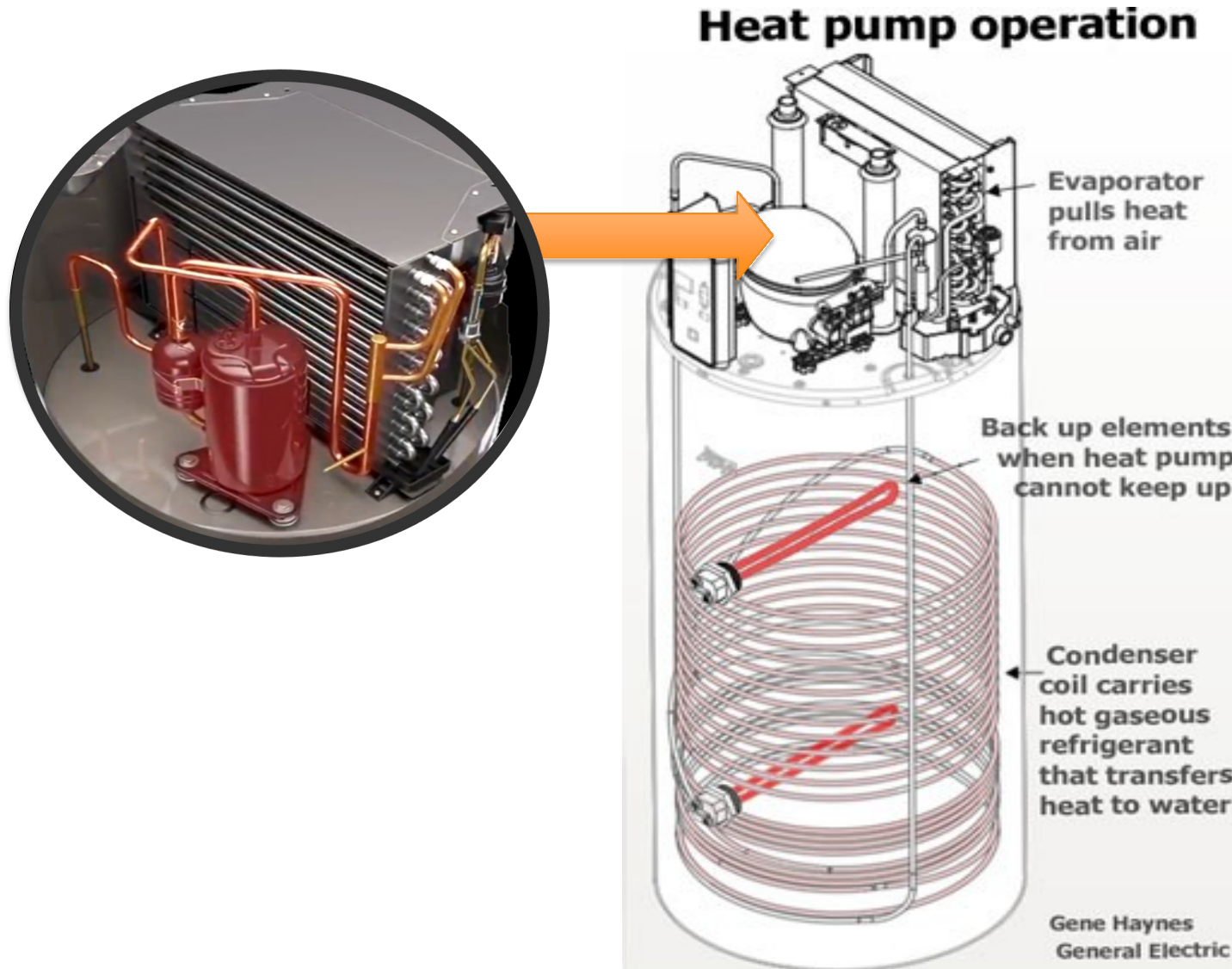


# Space Requirements & Solutions Summary

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- 6-inch clearance on top of EHWH needed for filter cleaning.
- No clearance from wall required.
- 700 cubic feet of space required for make up heat.
- Louvers and venting can be used to overcome space requirements.
- Keep venting simple (inside to inside is best).
- Determine if any extra venting parts are required.
- Don't exhaust air directly against solid surfaces or where people spend a lot of time.

# Heat Pumps Generate Condensate



Condensate is produced when water vapor in the air condenses on the cold evaporator coil while the compressor is running.

Condensate is **not** produced when incoming air temperature is below 37 F°.

# Condensate pH (Non-Acidic)

Hybrid heater condensate is non-acidic, similar to condensate from an air conditioner.

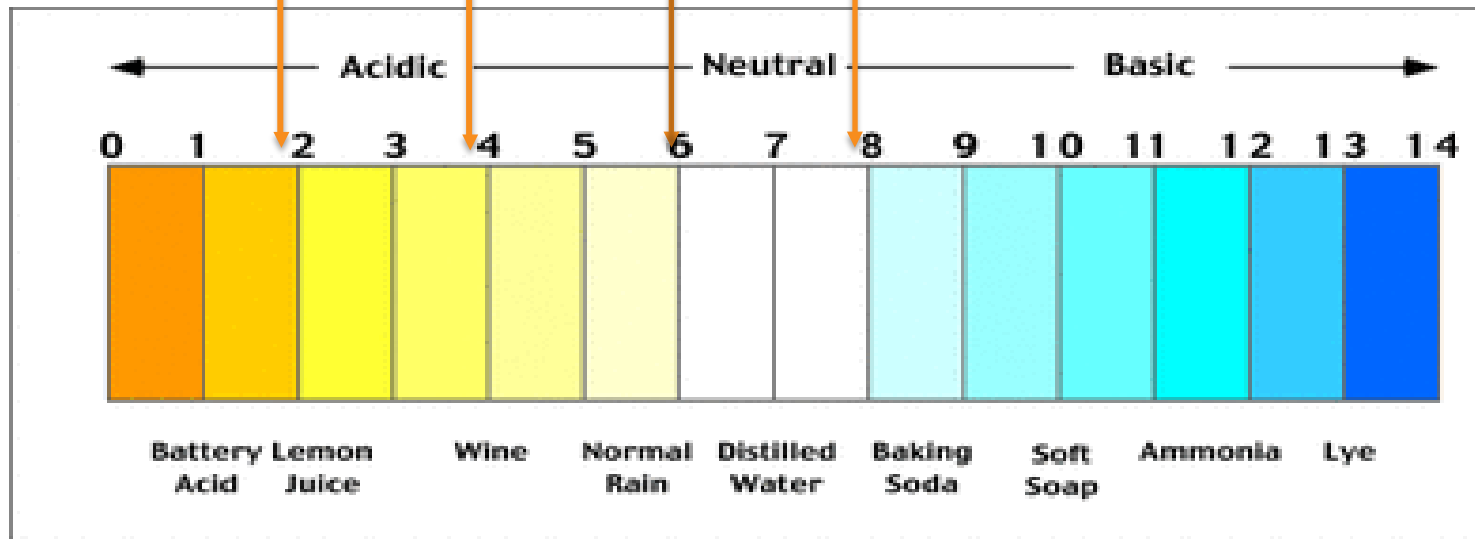
**It does not need to be neutralized like condensate from a condensing gas water heater.**



Neutralizers

Range of acidity for combustion produced condensate

Hybrid Condensate





## Condensate Drainage locations:

- Floor drains
- Sink drains
- Outside
- Laundry tubs
- Washing machine vent

**Tank must be level for drain pan to drain properly.**

# Condensate Management Summary

- Condensate only produced when compressor is running.
- Condensate is not acidic.
- Condensate drain can be plumbed into furnace condensate.
- Follow applicable code for condensate line and drainage.
- Installing a “T” connector rather than elbow at the start of the condensate line allows the line to be cleared of blockages and maintained.



# Sizing: First Hour Rating (FHR)



First Hour Rating is mostly defined by tank size - The larger the tank the higher the rating.



Hybrid water heaters have higher first hour rating than standard tanks in certain operating modes.



The test is done with a tank at setpoint temperature - hot water is drawn until the delivered water temperature starts to decrease.

## Hybrid First Hour Rating

Heater type	50-Gallon	66-Gallon	80-Gallon
Hybrid Heat Pump	66	79	84
Standard electric	62	N/A	80

# Sizing: Maximize Savings

- The larger the tank, the more hot water can be drawn using the compressor only.
- The compressor draws less than 500 watts.
- The heating element draws 4500 watts, almost 9 times more energy.



# Sizing: Usage Considerations

## The third shower dilemma

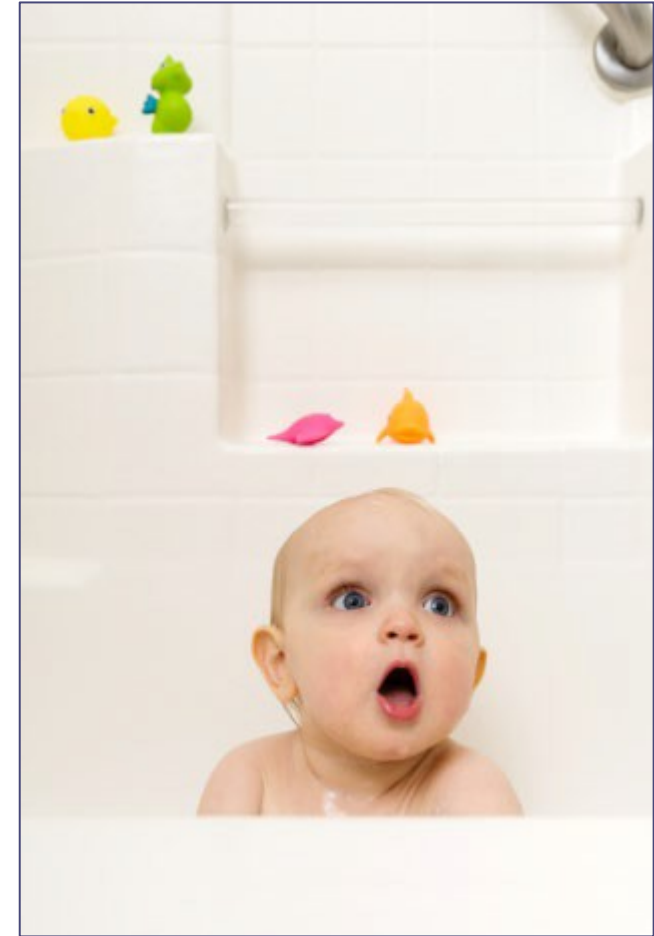
Many households are likely to have three or more back-to-back showers.

Consider the following sizing guidelines when bidding an EHWH:

# of consecutive 10-minute showers	Appropriate tank size
1-2	50 gallon
3	65 gallon
4+	80 gallon

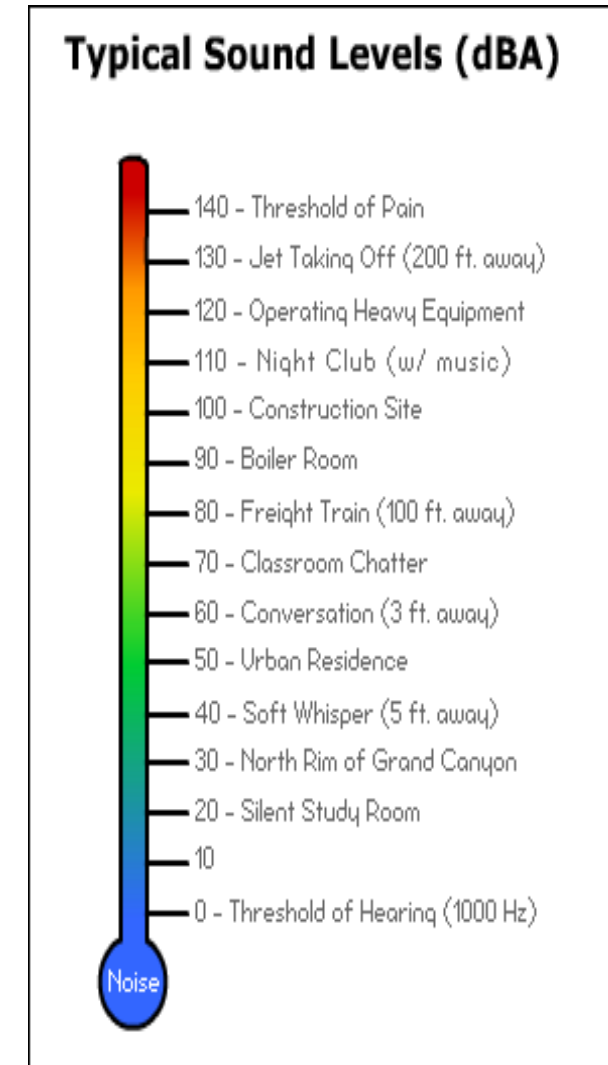
Tank temperature can be elevated with mixing valve.

Hybrid water heaters can use HP and resistance.



# Noise Mitigation = Vibration Isolation

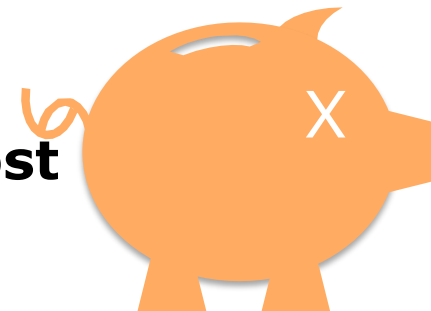
- Heat pump water heaters range in decibel ratings of 49 to 52 decibels.
  - About the same level as a modern dishwasher.
- Customer should be informed about this aspect, so they aren't surprised



# Sell on value not first cost

	2 People	4 People	6 People
Annual Savings	\$174	\$347	\$522
10-Year Savings	\$1,740	\$3,470	\$5,220

**Standard Electric tanks... no savings just cost**





## Utility EHWB Programs

<https://hotwatersolutionsnw.org/partners>

Download a utility rebate flyer for your state [here](#)

## Hot Water Solutions

<http://hotwatersolutionsnw.org>

## Thank You

Geoff Wickes

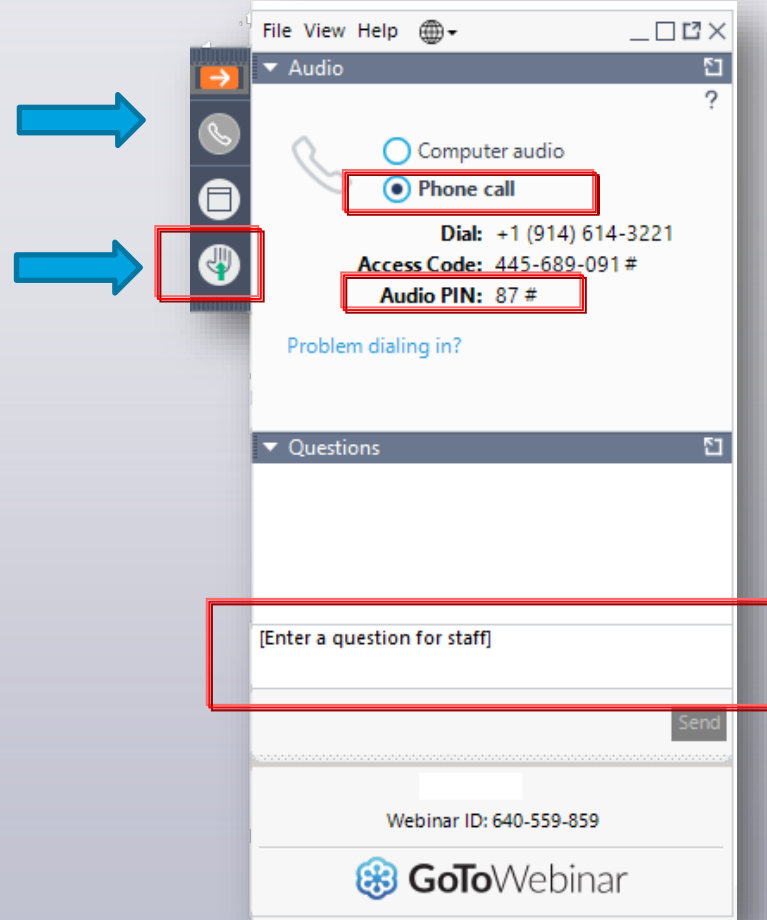
[gwickes@neea.org](mailto:gwickes@neea.org) 503.329.0523

Thank you!

# Discussion: Share Your Questions

Open and close  
your **control  
panel**

Raise your  
**hand** to enter  
the discussion



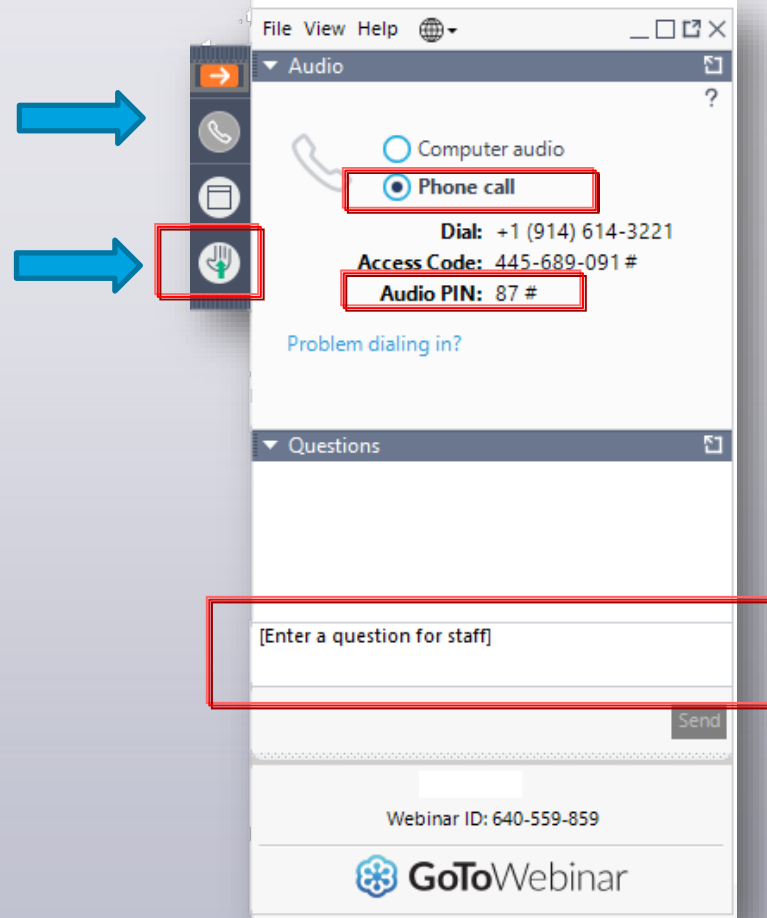
Please use the  
**questions box** to  
submit questions,  
comments, or  
alert us of  
technical  
difficulties

If you have called in on a phone today, double check that you've selected telephone as your audio option.

# Open Discussion

Open and close  
your **control  
panel**

Raise your  
**hand** to enter  
the discussion

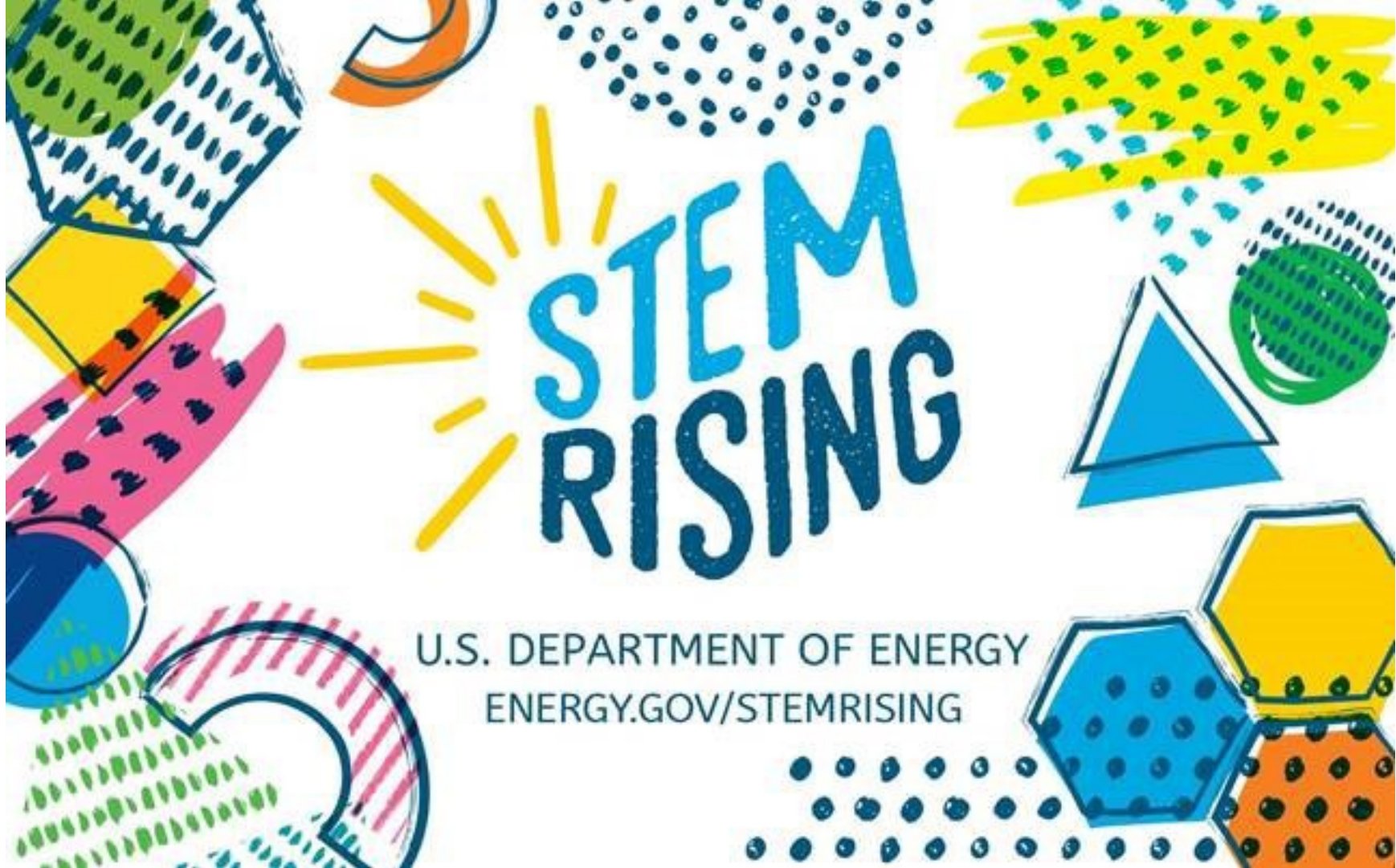


Please use the  
**questions box** to  
submit questions,  
comments, or  
alert us of  
technical  
difficulties

If you have called in on a phone today, double check that you've selected telephone as your audio option.

# Closing Poll

- **After today's call, what will you do?**
  - Consider implementing one or more of the ideas discussed
  - Seek out additional information on one or more of the ideas
  - Make no changes to your current approach
  - Other (please explain)



U.S. DEPARTMENT OF ENERGY  
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Resources to help improve your program and reach energy efficiency targets:

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- [Quick Answers](#) - provide answers and resources for common questions.
- [Proven Practices](#) posts - include lessons learned, examples, and helpful tips from successful programs.
- [Technology Solutions](#) **NEW!** - present resources on advanced technologies, **HVAC & Heat Pump Water Heaters**, including installation guidance, marketing strategies, & potential savings.



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